

Biogeochemical characteristics of vertical profiles of organic and inorganic elements in tidal flat sediments at urban estuarine

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We investigated biogeochemical characteristics of tidal flat sediments at urban estuarine by revealing vertical distribution of organic and inorganic elements. Five cores of 15 cm long were collected at the Fujimae tidal flat, the Port of Nagoya, Japan, in August 2012. For the subsamples of 1.5 cm interval (n = 50), major and trace elements, five types of phosphorus fraction, and carbon and nitrogen isotopic compositions were examined.

The sediments have C/N mol ratio of 15.1 and $\delta^{13}\text{C}$ value of -25.81 ‰ on average, which are almost the same as the riverine suspended particulate matter. This suggests that organic matter in the sediments is largely of terrestrial origin and thus is resistant to respiration, which implies eutrophication due to mineralization of organic matter could not be progressed. Fraction analyses of phosphorus compounds show that loosely adsorbed P and Fe-bound P account for about 70 % of total P at 0-1.5 cm sediment, and decrease to depth, then constant below 6 cm from the surface around 38 %. Heavy metal distribution indicates that the Fujimae tidal flat sediments are characterized by enrichment in Pb and Zn, with factors of 1.72 and 1.66 relative to the upper continental crustal values respectively.